ROYAL ASTRONOMICAL SOCIETY.

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FRANCIS BAILY, Esq., President, in the Chair.

The Rev. John Moore Heath, M.A., Fellow and Tutor of Trinity College, Cambridge, was balloted for, and duly elected a Fellow of the Society.

The following communications were read :—

I. Description of a small Observatory constructed at Poona, in the year 1842, accompanied by observations of Eclipses, &c. of *Jupiter's* Satellites. By Lieut. W. S. Jacob, R.N.

The observatory was built for the purpose of containing a 5-feet equatoreal of Dollond. It was commenced in May 1842, and was completed in three months, at an expense of about 25*l.* The building is of brick, 20 feet long, from east to west, and 10 feet broad; the angles at the east end being cut off, so as to form part of an octagon. Instead of a rotatory roof, a folding one was constructed, which could be opened on any side that might be required. This was effected by means of a truncated octagonal pyramid, attached by hinges to an octagonal frame, laid on the top of the wall of the building, each side of the pyramid opening independently of the rest, and the top being closed by a flat octagonal shutter, attached to one of the sides of the pyramid by hinges. To support the instrument, a pier was built of brick, in the form of a T, at the ends of which were three stones, forming cubes of thirteen inches, for the foot of the stand.

The following are the observed phenomena of *Jupiter's* satellites, the longitude of Poona being $4^h\ 55^m\ 46^s$ east, and the latitude $18°\ 30'\ 42''$ north.

Eclipses and Occultations of Satellites, and Transits of Satellites and Shadows.

Day, 1842.	Sat.	Phenomenon.	Sidereal Time.
			h m s
Aug. 10	I	Eclipse reappearance	21 7 37·7
Sept. 26	I	Ingr. of shad. { first contact	19 34 13
		{ total	19 36 24
	I	Egr. of sat. ... { first contact	20 35 32
		{ last contact	20 37 14
27	III	Egr. of sat. (last contact) ...	19 12 19
	I	Eclipse reappearance	19 15 30·5
	III	Ingr. of shad. { first contact	20 58 15
		{ total	21 3 36
Oct. 3	I	Egr. of sat. ... { first contact	22 54 17
		{ last contact	22 57 7
7	II	Eclipse reappearance	23 6 43
14	II	Occultation, immersion.....	20 42 23
18	I	Occultation, immersion.....	22 50 32
20	I	Eclipse reappearance	21 0 57
Nov. 9	III	Egr. of sat. ... { first contact	22 39 14
		{ last contact	22 44 32
	III	Ingr. of shad. { first contact	23 49 51
		{ total	23 55 42
11	I	Ingr. of sat.... { first contact	21 55 24
		{ total	22 0 36
	I	Ingr. of shad. { first contact	23 5 18
		{ total	23 8 26
12	I	Eclipse reappearance	22 46 20·3
Dec. 3	II	Eclipse reappearance	23 51 13·7

II. The following communications concerning the Great Comet of 1843 :—

1. A Letter from S. C. Walker, Esq., to Sir J. F. W. Herschel. Communicated by Sir John Herschel.

"*Philadelphia, May* 23, 1843.

"Sir,—From the observations made at the High School Observatory, from March 11th to April 10th, the earliest and latest dates at which the place of the nucleus was measured, we have computed the elements of the orbit on the model of Gauss' *Theoria Motus*, without making any hypothesis respecting the particular conic section in which the comet moves. The result has been as follows : —

Perihelion passage, February $27^{d}\cdot5893933$ Greenwich mean time.

Longitude of the Perihelion	280° 44′ 3″·7	mean eq. March 30.
Longitude of the ascending Node.....	15 57 3·2	
Inclination	34 19 52·0	
Perihelion Distance	0·00410369	
Gaussian Angle χ	2° 26′ 12″·05	
Eccentricity, Sec. χ	1·00090495	
Mean Sidereal Daily Motion.....	159″·58936	retrograde.

"The normal places used were —

		March 20·5. Mean Time, Greenwich.	March 30·5. Mean Time, Greenwich.	April 9·5. Mean Time, Greenwich.
From the App^{t} Equinox	Geo. R.A.	46° 4′ 38″·4	59° 51′ 1″·2	68° 56′ 41″·6
——	Geo. Decl.	− 9 9 45·5	− 6 36 32·5	− 4 45 35·7
Errors of the Hyperb. Ephem.	R.A.	− 0·6	+ 0·0	− 0·6
——	Decl.	+ 0·7	− 1·0	+ 0·3

"Our observations were made with a 9-feet Fraunhofer, power 75, and with a Fraunhofer filar micrometer. The places of the stars used for comparison were taken from the *Histoire Céleste* and Bessel's *Zone Observations*. A small error in our measures, or in the star catalogues, in the declination of the comet, causes a great change in the elements. Still, allowing to that source of error all the weight to which it is entitled, the orbit comes out an hyperbola, and the perihelion point is either in a tangent to the sun, or as nearly so, as physical circumstances will permit.

"I have the honour to be, &c.

"Sears C. Walker."

2. Observations of the Comet. By Captain Tucker, R.N. Commander of H. M. Ship Dublin. Communicated by the Lords Commissioners of the Admiralty.

The comet was first seen on the 3d of March, and observations, of which the following is a tabular statement, were made from the 4th to the 26th of March:—

Day and Ship Mean Time of Observations.	Ship's Longitude.	Ship's Latitude.	Observed Altitude of Comet.	Distance of Comet from known Stars.	Names of Stars of Comparison.	Length of Tail.
d h m s	° ′	° ′	° ′	° ′ ″		° ′
Mar. 4, 6 58 26	106 0 W.	8 10 S.	4 45	72 44 ...	Rigel	
7 4 28	.....	.....	4 30	48 44 30	Fomalhaut	
5, 7 0 57	107 17	11 2	7 30	47 28 30	α Eridani	
				66 16 0	Aldebaran	
6, 7 4 49	107 59	14 1	9 6	46 26 8	α Eridani	
				65 32 45	Rigel	
				85 59 0	Sirius	
				62 4 0	Aldebaran	
7, 6 30 0	108 22	16 44	6 5	61 56 15	Rigel	43 0
				59 25 0	Aldebaran	
				82 31 30	Sirius	
8, 6 41 54	107 31	18 21	16 32	79 34 0	Sirius	
				59 3 0	Rigel	
7 6 4	.....	.....	14 0	79 33 0	Sirius	
				56 44 30	Aldebaran	
9, 7 10 23	106 29	19 33	14 48	76 39 15	Sirius	
				55 49 50	Rigel	

Day and Ship Mean Time of Observations.	Ship's Longitude.	Ship's Latitude.	Observed Altitude of Comet.	Distance of Comet from known Stars.	Names of Stars of Comparison.	Length of Tail.
d h m s	° ′	° ′	° ′	° ′ ″		° ′
				73 45 0	Sirius	
Mar. 10, 6 52 15	106 17 W.	20 41 S.	18 30	52 28 50	Rigel	
				46 17 0	α Eridani	
				46 31 0	α Eridani	
11, 7 1 35	105 25	22 4	18 12	71 2 0	Sirius	
				50 11 50	Rigel	
				68 36 15	Sirius	
12, 7 15 10	105 16	24 1	18 0	47 14 45	Rigel	
				46 31 15	Aldebaran	
				46 57 0	α Eridani	
				57 40 0	Sirius	
17, 7 8 15	96 44	30 45	20 ...	35 36 30	Rigel	
				36 49 0	Aldebaran	
				49 3 0	α Orionis	
				55 58 0	Sirius	42 16
				33 49 13	Rigel	
18, 7 14 40	95 52	32 0	20 17	60 18 0	Canopus	
				35 19 0	Aldebaran	
				47 0 30	α Orionis	
				54 11 0	Sirius	
				31 57 15	Rigel	
19, 7 19 40	93 52	32 35	.....	33 56 0	Aldebaran	
				59 21 0	Canopus	
				45 20 45	α Orionis	
				52 10 30	Sirius	45 0
				30 9 8	Rigel	
20, 7 11 30	90 5	33 13	.....	32 19 30	Aldebaran	
				43 35 0	α Orionis	
				58 46 0	Canopus	
				49 31 30	Sirius	
				26 49 53	Rigel	
22, 7 34 38	86 42	34 24	20 0	57 27 30	Canopus	
				30 3 0	Aldebaran	
				44 27 0	Sirius	36 26
				55 46 0	Canopus	
26, 7 15 57	82 40	32 2	23 30	21 12 23	Rigel	
				26 24 30	Aldebaran	
				34 19 53	α Orionis	

3. Observations of the Comet made at Auckland, New Zealand, accompanied by a map of its progress amongst the stars. By John Collyer Haile, Esq. Communicated by G. B. Airy, Esq.

The comet was first seen on the 2d of March, and continued visible till the 2d of April. The following places of the comet are annexed, which are deduced from observations made at Auckland, though the method of observation is not mentioned, nor are any details given :—

Day, 1843.	Time.	Right Ascen.	Declination S.	Length of Tail.
	h m	h m s	° ′ ″	° ′
Mar. 7	8 2	0 43 27	9 39 8	32 30
9	7 37	1 10 52	10 55 48	35 10
10	7 45	1 24 7	11 21 44	35 50
13	7 58	1 58 32	11 10 42	
19	7 35	2 49 3	9 27 50	41 50
20	7 37	3 0 2	9 22 43	41 30
24	8 3	3 25 50	8 29 13	35 10

Long. of Auckland 174° 45′ 40″ East.
Lat. of ditto 36 51 0 South.

4. Notes on the Comet, extracted from the Journal of Captain G. Rodney Mundy, R. N. Commander of H.M.S. Iris. Communicated by G. B. Airy, Esq.

5. Extracts from a Daily Journal of Remarks and Observations on the Comet, as seen at Van Dieman's Land. By Lieut. Kay, R. N. Communicated by Lieut.-Colonel Sabine, R. A.

The tail of the comet was first seen on the 1st of March. The nucleus was first seen on the 6th of March; and on this evening the observed length of the tail was 23° 20′, being at its broadest part about 54′ in breadth; the extreme breadth and the greatest condensation of light occurring at a distance of 12° from the nucleus.

On the 7th, the tail was 26° in length, and 50′ in extreme breadth. A dark line commencing near the middle and extending to the end, divided the tail into two portions.

On the 9th, the length of the tail was 39°, and its extreme breadth 76′. The dark line was again observed, commencing at about the middle of its length.

On the 11th, the nucleus was well seen, and examined with great care. No stellar point was visible, but its appearance was that of a large star covered with a thin film of cloud, or viewed through a telescope which had not been adjusted to focus. The length of the tail was 45°, and the extreme breadth 76′.

On the 12th, a different telescope was employed for the examination of the nucleus, but no stellar point was visible. The length of the tail was 42°, and its breadth 80′.

On the 14th, 22d, 24th, and 27th, the observed length of the tail was 42°, 40°, 39°, and 35°, respectively.

The following table exhibits the distances from conspicuous stars which were observed with the sextant:—

Day, 1843.	Mean Solar Time.	Observed Distance.	Star of Comparison.
	h m s	° ′	
March 7	7 30 0	62 17	Aldebaran.
	7 36 0	104 49	α^2 Centauri.
	7 38 0	64 36	Rigel.
	7 40 0	77 31	α Orionis.
	7 42 0	102 34	Procyon.
	7 44 0	85 9	Sirius.
	7 47 0	76 43	Canopus.
10	7 38 13	53 24	Aldebaran.
		70 51	Canopus.
	7 45 50	53 26	Aldebaran.
		70 49	Canopus.
11	7 36 1	69 9	Canopus.
		50 28	Aldebaran.
	7 44 15	46 19	α Eridani.
		64 4	α Orionis.
	7 49 50	107 17	α^2 Centauri.
		89 25	Procyon.
	8 1 19	72 46	Sirius.
		93 44	Castor.
	8 9 22	64 11	α Orionis.
		69 20	Canopus.
12	7 44 15	67 38	Canopus.
		48 14	Aldebaran.
	7 54 27	46 36	α Eridani.
		62 18	α Orionis.
	8 2 2	108 11	α^2 Centauri.
		87 5	Procyon.
	8 10 1	99 54	ι Argûs.
		70 15	Sirius.
	8 19 10	67 32	Canopus.
		92 45	Pollux.
13	8 4 6	43 41	Aldebaran.
		64 49	Canopus.
	8 12 28	47 34	α Eridani.
		56 58	α Orionis.

Day, 1843.	Mean Solar Time.	Observed Distance.	Star of Comparison.
	h m s	° ′	
March 13	8 20 39	43 49	Rigel.
	8 21 36	65 15	Sirius.
	8 22 43	81 51	Procyon.
	8 26 14	97 58	Argûs.
23	7 25 41	57 38	Canopus.
		30 52	Aldebaran.
	7 40 23	52 44	α Eridani.
		41 30	α Orionis.
	7 56 26	28 1	Rigel.
		103 11	Regulus.
	8 5 3	65 49	Procyon.
		30 54	Aldebaran.
	8 13 55	41 28	α Orionis.
		28 4	Rigel.
	8 20 55	57 40	Canopus.
		50 27	Sirius.
24	7 51 20	54 20	α Eridani.
		28 49	Aldebaran.
	7 58 7	103 12	Regulus.
		25 11	Rigel.
	8 3 34	25 12	Rigel.
		28 51	Aldebaran.
	8 8 5	47 46	Sirius.
		38 34	α Orionis.
	8 13 23	54 22	α Eridani.
		62 51	Procyon.
27	7 45 58	55 40	Canopus.
		25 49	Aldebaran.
	7 56 10	56 3	α Eridani.
		20 59	Rigel.
	8 1 8	97 32	Regulus.
		44 4	Sirius.

6. Extract of a letter from A. Abbott, Esq. containing remarks on the Comet as seen at Madeira, accompanied by two drawings. Communicated by Sir John Herschel.

7. Observations of the Comet by Captain P. P. King, R.N., made at Port Stephens, New South Wales. Communicated by Captain Beaufort, R.N.

The tail of the comet was first seen at Port Stephens on the 2d of March, producing great alarm among the natives.

On the 3d it was again seen, and a second ray was observed extending obliquely from it, and making with it an angle of 10°.

On the 4th, the nucleus was observed with an achromatic telescope when about 8° above the horizon. It appeared like a reddish stellar spot, the limbs well defined, and about 1′ in diameter by estimation. On this evening and the following, distances of the comet from neighbouring stars were measured with the sextant.

On March 18th and following days, comparisons of the comet with neighbouring stars were made with an annular micrometer attached to an achromatic telescope, of which the following are the most important:—

March 19, $7^h\ 37^m\ 14^s$ sidereal time (mean of three observations), the nucleus was east of η *Eridani* $3^m\ 53^s{\cdot}22$, and 7′ 0″ south of it.

March 20, $7^h\ 36^m\ 57^s{\cdot}5$ sidereal time (mean of four observations), the nucleus was east of η *Eridani* $11^m\ 16^s{\cdot}23$, and 11′ 39″ north of it.

March 23, $7^h\ 27^m\ 6^s{\cdot}3$ sidereal time (mean of three observations), the nucleus was $4^m\ 17^s{\cdot}2$ east, and 9′ 19″ south of ζ *Eridani*.

March 29, $8^h\ 26^m\ 59^s{\cdot}1$ sidereal time (mean of three observations), the nucleus was $12^m\ 0^s{\cdot}28$ west, and 15′ 41″ north of A *Eridani*.

This paper was accompanied by a map shewing the path of the comet amongst the stars, and by drawings of its appearance on successive nights.

8. Abstract of an article in *Le Cernéen*, a newspaper published at Port Louis, Mauritius, March 14, 1843. Communicated by G. B. Airy, Esq.

9. An article extracted from the *Colonial Observer*, of March 8, 1843. Published at Sidney, New South Wales. Communicated by F. Baily, Esq.

10. Copy of a Letter addressed to the Editor of the *New Zealand Colonist* by Captain W. M. Smith, R.A.; and extracts from three other Letters from New Zealand. Communicated by F. Baily, Esq.

11. Observations of the Comet, as seen off the Island of Timor, at the south-eastern entrance to the Indian Archipelago, at sea, by J. A. Murray, Esq. Communicated by G. B. Airy, Esq.

12. Pen-drawings of the appearance of the Comet, by Mrs. Grant. Communicated by Sir John Herschel.

13. A Letter from R. H. Williams, Esq., containing an extract from Notes on the Comet made at the Observatory of Batavia. Communicated by G. B. Airy, Esq.

14. Remarks on the Comet, as seen at Galveston, Texas, by W. Bollaert, Esq. Communicated by F. Baily, Esq.

15. Letter from the Rev. W. S. Mackay to Sir John Herschel, dated Calcutta, June 10, 1843. Communicated by Sir John Herschel.

The comet was first seen at Calcutta on the 5th of March, and continued visible until April 3. Distances from bright stars were observed, from which approximate right ascensions and declinations have been deduced.

Mr. Mackay observes with respect to the star *η Argûs*, that "in March last, it had become a star of the first magnitude, fully as bright as *Canopus*, and in colour and size very much like *Arcturus*. This has been observed by several other persons to whom I pointed it out. Is the star known as a variable star, or is the change now first observed? *α Crucis* looked quite dim beside it."

With regard to the variability of *η Argûs* Sir John Herschel remarks as follows:—

The sudden increase of *η Argûs* from a star intermediate between the first and second magnitude, to a first-rate first magnitude, which took place between 1837 and 1838, was mentioned by me in a letter to Messrs. Beer and Mädler, of which an extract is in No. 354 of Schumacher's *Astronomische Nachrichten*. It was then *far inferior* to *Canopus*, but equal to *Arcturus*, and very nearly, or quite so, to *α Centauri*. It had diminished materially when I left the Cape in April 1838, but was still a great star of the first magnitude. It would appear to be now making another start forward. If this continue, we may have a rival to *Sirius*, or, perhaps, to the planets. In 1838, its brightness was such as to obliterate many curious and interesting details of the great nebula in its immediate proximity, which I had fortunately recorded in its former state.

I do not quite understand Mr. Mackay's distinction between *size* and *brightness* of a fixed star. *Canopus* is at least double of *Arcturus* in its quantity of light. *Arcturus* and *α Centauri* are nearly equal, the latter, however, being somewhat the brighter of the two.

I take this opportunity to mention, that I remain fully convinced of the reality of the periodical variation of *α Orionis*. Not so of *α Cassiopeiæ*, in the case of which star the amount of supposed change, however, was very much less considerable, and in which, on account of its difference of colour from *γ*, the compared star, *the moon affects the comparison*, when above the horizon.

16. Observations of the Comet made in March 1843, at the Mauritius. By W. Lloyd, Esq.

The comet was first seen on the 1st of March, and its nucleus was seen by Mr. Lloyd on the 3d. On the 4th, instruments were set up at Doguet, on Les Plaines Willhems, and observations were commenced. These consist chiefly of observations of altitudes and azimuths, the details of which are given. The comet was observed till the 22d of March.

III. Occultations observed at Ashurst in the year 1843, by R. Snow, Esq.

Day.	Name of Star.	Phenom.	Limb.	True Sidereal Time.	Remarks.
				h m s	
Feb. 12	ζ Cancri	Em.	Bright	11 38 29·4	
April 10	16 Sextantis ...	Imm.	Dark	13 36 52·2	Excellent.
		Em.	Bright	14 33 43·7	Not good.
11	g^1 Leonis	Imm.	Dark	13 45 19·5	Excellent.
		Em.	Bright	14 47 43±	Not good.
	g^2 Leonis	Imm.	Dark	13 57 59	Good.
May 9	e Leonis	Imm.	Dark	11 45 11·3	Beautiful.
Aug. 17	σ^1 Arietis	Imm.	Bright	20 32 1·9	Excellent.
		Em.	Dark	21 23 54·4	Ditto.
20	3 Geminorum	Em.	Dark	0 30 33	Emerged gradually.
Sept. 13	ζ Arietis	Imm.	Bright	3 57 41·5	

IV. Right Ascensions and North Polar Distances of the Comet of Mauvais observed at Hamburg. By C. Rumker, Esq. Communicated in a letter to F. Baily, Esq., dated July 25, 1843.

Day, 1843.	Mean Time at Hamburg.	Right Ascension.	Declination.
	h m s	° ′ ″	° ′ ″
May 24	12 49 10·1	337 57 16·2	+28 10 17·9
29	12 44 21·3	340 18 39·1	27 33 2·7
30	12 9 11·8	340 45 15·3	27 25 7·4
June 4	12 35 2·2	342 55 46·4	26 39 0·4
6	12 40 17·1	342 45 19·2	26 18 4·5
18	11 47 27·3	348 5 2·1	23 44 8·3
19	13 23 44·1	348 26 51·1	23 28 18·8
20	12 11 51·1	348 46 19·3	23 13 41·4
23	12 2 49·7	349 39 53·2	22 23 51·9
July 3	12 57 34·8	352 9 49·9	19 4 16·5
4	12 6 56·6	352 21 45·8	18 43 27·7
5	12 11 24·4	352 33 45·1	18 19 24·7
6	11 56 10·2	352 44 57·6	17 55 41·7
7	13 18 53·0	352 56 25·3	17 30 7·0
9	12 21 19·5	353 16 18·3	.....
9	12 27 41·0	.....	16 40 43·1
19	12 4 48·1	354 27 0·0	11 54 26·6
20	11 53 56·5	354 31 11·6	+11 22 31·9

In a letter to Dr. Lee, dated August 18, 1843, the following additional places of the comet were communicated :—

Day, 1843.	Mean Time at Hamburg.	Right Ascension.	Declination.
	h m s	° ′ ″	° ′ ″
July 30	11 32 52·7	354 45 11·1	+5 33 28·1
Aug. 2	11 55 10·6	354 39 47·1	3 37 50·0
3	11 45 19·3	354 36 33·9	2 58 57·3
4	12 30 1·8	354 32 53·2	2 18 14·8
6	12 29 55·8	354 24 42·5	0 57 58·0
7	13 6 1·3	354 20 7·5	+0 16 29·4
8	14 23 45·6	354 13 57·9	−0 26 29·3

From the former of these sets of observations, M. Götze calculated the following elements of the orbit of the comet :—

Perihelion Passage, 1843, May 6·90816 Greenwich mean time.

Longitude of Ascending Node ...	157° 13′ 23″·72	From mean Equinox of June 20, 1843.
Longitude of Perihelion	281 50 58·99	
Inclination	52 53 2·94	
Log. Perihelion Distance	0·2097314	Motion direct.

V. On the Divisions of the Exterior Ring of the Planet *Saturn*. By the Rev. W. R. Dawes.

The existing evidence relating to a division of the outer ring of the planet *Saturn*, into two or more concentric rings, is of a very conflicting character. A few observers have been well satisfied that they have occasionally perceived such a division, among whom stand conspicuous, Short, the celebrated maker of reflecting telescopes, Professor Quetelet, of Brussels, and Captain Kater, whose paper on the subject, published in Vol. IV. Part 2, of the *Memoirs of the Astronomical Society*, discusses the subject at some length, in addition to a detail of his own observations. The evidence on the other side of the question, however, though of a negative character, has always appeared to me so strong, that I must confess myself to have been somewhat incredulous of the supposed fact of any subdivisions existing. This circumstance increases my inclination to put on record a recent observation of a peculiarly satisfactory kind.

September 7, 1843.—At Mr. Lassell's observatory, Starfield, near Liverpool. The day had been cloudless and remarkably warm, the maximum of the thermometer being 76° where all precautions had been taken to keep it as cool as possible. In the evening the sky was hazy and the stars dull. At about 9 P.M. Mr. Lassell turned his equatoreally mounted 9-foot Newtonian reflector, of 9 inches aperture, upon *Saturn*, with a power of 200, and was electrified at the beautifully sharp and distinct view of the planet presented to him. Having applied as an eye-piece an achromatic lens (being the object-glass of a microscope), which produced a power of 450 times, Mr. Lassell examined the planet for a few minutes. I then took my place at the telescope, and Mr. Lassell requested

me to examine carefully the extremities of the ring, and say if I observed any thing remarkable. Having obtained a fine adjustment of the focus, I presently perceived the outer ring to be divided into two. This perfectly coincided with the impression Mr. Lassell had previously received. For some minutes I scrutinised this interesting object, and occasionally, for several seconds together, had by far the finest view of *Saturn* that I was ever favoured with. The outline of the planet was very hard and sharply defined with power 450; and the primary division of the ring very black and steadily seen all round the southern side. *When this was most satisfactorily observed*, a dark line was pretty obvious on the outer ring. I was not only perfectly satisfied of its existence, but had time during the best views carefully to estimate its *breadth*, in comparison with that of the division ordinarily seen. The proportion appeared to me to be as one to three; but Mr. Lassell estimated it at *scarcely* one-third. It is certainly rather *outside the middle* of the outer ring, and is broadest at the major axis, being in this respect precisely similar to the primary division. *It was equally visible at both ends of the ring.*

For further satisfaction, other eye-pieces were tried. A positive double eye-tube, magnifying 400 times, came nearest to the achromatic lens in efficiency; yet the latter gave the impression of equal sharpness and light, with an increase of 50 in the power. With 400 the secondary division was perceptible during occasional best views of the planet; but no lower power displayed it at all, though with them the usual features of *Saturn* were splendidly distinct. A positive double eye-piece producing a power of 520 was also applied; but by this time the state of the air had deteriorated; and though some confirmatory glimpses were obtained, the view was not so good as with the achromatic lens.

Neither Mr. Lassell nor myself obtained a single glimpse of any further subdivisions of the ring. The shading of the interior edge of the inner ring was very obvious, but no dark line was even suspected in that situation.

From my description of this splendid telescopic view of *Saturn*, it will be seen that it was very similar to that depicted by Captain Kater, in fig. 3 of his drawings of the planet, in Vol. IV. Part 2, of the *Memoirs;* except that, in his plate, the outer ring is much too broad in proportion; and also that his subdivision *bisects* the outer ring. Moreover, the ring is now more obliquely seen than in 1825, and the *northern* side of it is in view. It is difficult to suppress the unavailing regret that the planet was not, as in that year, at an altitude of about 60°, instead of only 14°; and that the atmosphere of this country is so rarely in a state to do justice to the capabilities of our most powerful and perfect instruments.

It may be proper to remark, that a record of our observations was entered in Mr. Lassell's journal both by him and myself, from which the above account has been compiled.

November 8th, 1843. W. R. Dawes.

London :—Printed by Moyes and Barclay, Castle Street, Leicester Square